TOOL AND METHOD FOR FORMING AN INTEGRATED OPTICAL CIRCUIT

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ABSTRACT OF THE DISCLOSURE

Tools and methods for making molded an optical integrated circuit including one or more waveguides are disclosed. In one embodiment, a molding die is provided that includes a substrate that has a topographically patterned first surface. A conformal protective film is provided over the first surface of the substrate. The substrate may be formed of silicon or gallium arsenide, and may be patterned using conventional semiconductor patterning techniques, such as plasma etching. The protective film may be metal (e.g., nickel or titanium), diamond, or some other hard material. Typically, a plurality of such molding dies are formed from a wafer of the substrate material. The die is pressed into a moldable material, such as thermal plastic, to form the wave guide(s) of the optical integrated circuit. A plurality of the dies may be mounted around the curved surface of a heated roller, and a heated tape of the waveguide material may be fed under the roller in a mass production process. Alternatively, the die may be mounted in an injection molding cavity, and the IOC may be formed by an injection molding process.